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Semantic analysis of concurrent ML by abstract model-checking

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Abstract

In this paper we present a new kind of semantics for Concurrent ML, apopular concurrent extension of the MLfunctional language equipped with message-passing inter-processcommunication along first-class channels. This semanticsis based on infinite domains of higher-dimensional transition systems that are able to model the asynchronous execution of concurrentoperations and is operational in nature.

By dual abstract interpretation using folding of states and truncation oftransitions *finite* automata can be automatically derived that representa sound but imprecise semantics of a given program. They are used to compute staticproperties verified by the standardconcurrent execution of the program by means of abstractmodel-checking of modal logic formulae.

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